DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING

PERMIT

This is to certify that * 410 RIVERSIDE ST LLC

Located At 410 RIVERSIDE

Job ID: 2011-01-240-FAFS

CBL: 320 - - A - 002 - 001 - - - - -

has permission to install Fire Suppression System

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.	A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be procured prior to occupancy.

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY.

PENALTY FOR REMOVING THIS CARD

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

1.

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCU0PIED.

Director of Planning and Urban Development
Penny St. Louis Littell

Job ID: 2011-01-240-FAFS **Located At** 410 RIVERSIDE **CBL** 320 - - A - 002 - 001 - - - - -

Conditions of Approval:

Zoning

410 Riverside St. / 51 Ingorsoll Dr.

1. This property shall remain a warehouse, production & distribution of medical gasses. Any change of use shall require a separate permit application for review and approval.

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No:	Date Applied:	CBL:	
2011-01-240-FAFS	1/11/2011	320 - - A - 002 - 001 - - - - -	
Location of Construction: 410 RIVERSIDE /51 Ingersoll Dr	Owner Name: * 410 RIVERSIDE ST LLC	Owner Address: 70 INGERSOLL DR PORTLAND, ME - MAINE 04103	Phone:
Business Name: Airgas	Contractor Name: Garland, Scott	Contractor Address: P.O. Box 1285 LEWISTON MAINE04240	Phone:
Lessee/Buyer's Name:	Phone:	Permit Type: FIRE SYS NWB - Fire Suppression Non-Water Based	Zone: I-M
Past Use: Warehouse-Production & distribution of medical gasses (Airgas)	Proposed Use: Same – Warehouse – production & distribution of medical gasses (Airgas)	Cost of Work:	CEO District:
		Fire Dept: ✓ Approved w/ conditions ___ Denied ___ N/A Signature: RG	Inspection: Use Group: Type: Signature:
Proposed Project Description: install Fire Suppression Sys		Pedestrian Activities District (P.A.D.)	
Permit Taken By:			

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building Permits do not include plumbing, septic or electrial work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland	___ Variance	✓ Not in Dist or Landmark
___ Wetlands	___ Miscellaneous	___ Does not Require Review
___ Flood Zone	___ Conditional Use	___ Requires Review
___ Subdivision	___ Interpretation	___ Approved
___ Site Plan	___ Approved	___ Approved w/Conditions
___ Maj ___ Min ___ MM	___ Denied	___ Denied
Date: OK with Condition 1/13/11	Date:	Date:

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the appication is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT ADDRESS DATE PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE DATE PHON

Job Summary Report
Job ID: 2011-01-240-FAFS

Job Type:	Fire Alarm / Suppression	**Job Description:**	51 Ingersoll Drive / 410 Riverside St Airgas	**Job Year:**	2010
Building Job Status Code:	Initiate Plan Review	**Pin Value:**	419	**Tenant Name:**	
Job Application Date:		**Public Building Flag:**	N	**Tenant Number:**	
Estimated Value:	6,000	**Square Footage:**			
Related Parties:		* 410 RIVERSIDE ST LLC		*Property Owner*	
		Sprinkler Systems Inc - Scott Garland		*FIRE ALARM INSTALLER*	

Job Charges

Fee Code Description	Charge Amount	Permit Charge Adjustment	Net Charge Amount	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Net Payment Amount	Outstanding Balance

Location ID: 34520

Location Details

Alternate Id	Parcel Number	Census Tract	GIS X	GIS Y	GIS Z	GIS Reference	Longitude	Latitude
R17390	320 A 002 001		M				-70.328422	43.691175

Location Type	Subdivision Code	Subdivision Sub Code	Related Persons	Address(es)
1				410 RIVERSIDE STREET WEST

Location Use Code	Variance Code	Use Zone Code	Fire Zone Code	Inside Outside Code	District Code	General Location Code	Inspection Area Code	Jurisdiction Code
WAREHOUSE & STORAGE		NOT APPLICABLE I M					DISTRICT 8	RIVERSIDE

Structure Details

Structure: Office/ Production & Distribution Airgas warehouse / production is distribution / medical gases

Occupancy Type Code:

Structure Type Code	Structure Status Type	Square Footage	Estimated Value	Address
Industrial Building	0			410 RIVERSIDE STREET WEST

Longitude	Latitude	GIS X	GIS Y	GIS Z	GIS Reference

User Defined Property	Value

Permit #: FIRE SYS NWB-669

Permit Data

Job Summary Report
Job ID: 2011-01-240-FAFS

Location Id	Structure Description	Permit Status	Permit Description	Issue Date	Reissue Date	Expiration Date
34520	Office/ Production & Distribution Airgas	Initialized	install Fire Suppression System			

Inspection Details

Inspection Id	Inspection Type	Inspection Result Status	Inspection Status Date	Scheduled Start Timestamp	Result Status Date	Final Inspection Flag

Fees Details

Fee Code Description	Charge Amount	Permit Charge Adjustment	Permit Charge Adj Remark	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Payment Adj Comment
Job Valuation Fees	$80.00							

PDF e-mail

Fire Suppression System Permit

If you or the property owner owes real estate or property taxes or user charges on any property within the city, payment arrangements must be made before permits of any kind are accepted.

Installation address: 51 Ingersoll Dr. CBL: 320-A-2-

Exact location: (within structure) AirGas

Type of occupancy(s) (NFPA & ICC): EXTRA HAZARD GROUP 1

Building owner: AIRGAS

Managing Supervisor: Scott E. Garland License No: 278

Supervisor phone: 775-1521 E-mail: scottssi@maine.rr.com

Installing contractor: Sprinkler Systems, Inc. License No: 093

Contractor phone: 775-1521 E-mail: krisssi@maine.rr.com

The suppression work to be done will be: New: ☒ Renovation: ☐ Addition to existing system: ☐

This is an amendment to an existing permit: Yes: ☐ NO ☒ Permit no:

NFPA Standard will this system is designed to: NFPA #13 Edition: 2007

*Non-NFPA systems are not approved for use within the City of Portland.

Attach all design information and complete approved submittals as may be required by the State Fire Marshal's Office.

Contractor shall verify location and type of all FDCs shall be approved in writing by the Fire Prevention Bureau.

COST OF WORK: $6,000

PERMIT FEE: $90.00
($10 PER $1,000 + $30 FOR THE FIRST $1,000)

Download a new copy of this document from www.portlandmaine.gov for every submittal. Submit all information to the Building Inspections Department, 389 Congress Street, Room 315, Portland, Maine 04101.

Prior to acceptance of any fire protection system, a complete commissioning and acceptance test must be coordinated with all fire system contractors and the Fire Department, and proper documentation of such test(s) provided.

All installation(s) must comply with NFPA and the Fire Department Technical Standard(s).

Applicant signature: Kris Ell Date: 12-28-10

RECEIVED
JAN 10 2011
Dept. of Building Inspections
City of Portland Maine

FIRE CONDITIONS

1. Installation shall comply with City Code Chapter 10.
2. The Fire alarm and Sprinkler systems shall be reviewed by a licensed contractor[s] for code compliance. Compliance letters are
3. required.
4. Fire department connection type and location shall be approved in writing by fire prevention bureau.
5. System acceptance and commissioning must be coordinated with alarm and suppression system contractors and the Fire Department. Call 874-8703 to schedule.
6. Installation of a sprinkler or fire alarm system requires a Knox Box to be installed per city ordinance.
7. The Fire Department will require knox locking caps on all Fire Department Connections on the exterior of the building.
8. Application requires State Fire Marshal approval.
9. The sprinkler system shall be installed in accordance with NFPA 13.
10. checked at the end of each day to insure the system has been placed back in service.
11. Sprinkler protection shall be maintained. Where the system is to be shut down for maintenance or repair, the system shall be

State of Maine

Department of Public Safety

Fire Sprinkler System Permit

9345

Airgas

Located at: 51 Ingersoll Dr.
In the Town of: Portland
Occupancy/Use: Warehouse
Type of System: NFPA 13

Permission is hereby given to:

Sprinkler Systems, Inc.
PO Box 1285
Lewiston, ME 042431285
Contractor License # **93**

to begin installation according to plans submittal approved by the Office of State Fire Marshal. The submittal is filed under log # **2101449** , and no departure from the application submittal shall be made without prior approval in writing. This permit is issued under the provisions of Title 32, Chapter 20. Nothing herein shall excuse the holder of this permit from failure to comply with local ordinances, zoning laws, or other pertinent legal restrictions. This permit shall be displayed at the construction site or be made readily available.

This permit was issued on **12/31/2010** for a fee paid of **$100.00**

This permit will expire at midnight on ***Wednesday, June 29, 2011***

The expiration date applies only if the installation has not begun by that date and no permission has been granted to extend the date. Once installation begins, then the permit is valid for however long it takes to complete the installation, assuming that the work is fairly continuous.

Anne H. Jordan
Commissioner

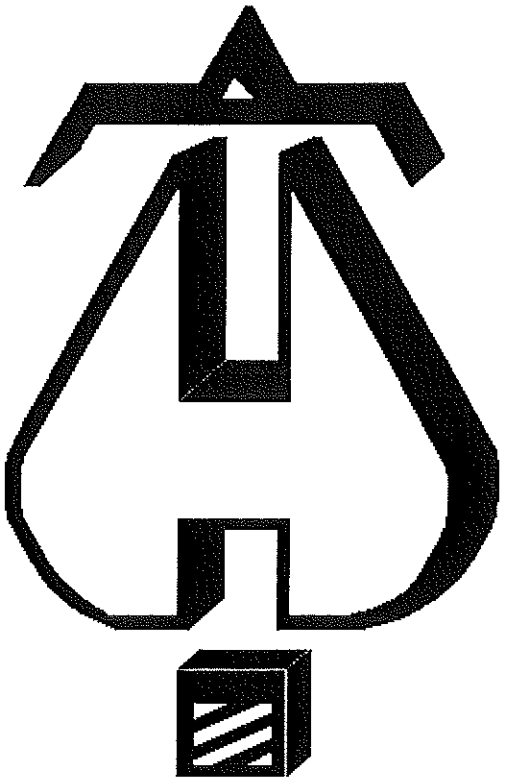
The type of Fire Department Connection and its location is to be according to the Local Fire Department

Within 30 days of the completion of a new fire sprinkler system or an addition to an existing fire sprinkler system, a fire sprinkler system contractor shall provide to the Licensing and Inspections Unit a copy of this permit signed and dated by the certified Responsible Managing Supervisor representing that the fire sprinkler system has been installed according to specifications of the approved plan to the best of the supervisor's knowledge, information, and belief. This requirement is part of the sprinkler law, and neglect of this duty is grounds to not renew the contractor's license to do work in the State of Maine. All renewed sprinkler licenses are good for two years and expire on a June 30th.

Job completed, tested and verified on date of _____

RMS for this job: Garland Scott E.

RMS Signature: _____



. . . Fire Protection by Computer Design

Sprinkler Systems, Inc.
2-4 Avon Street
P.O. Box 1285
Lewiston, Maine 04240
207-782-0104

Job Name : Air Gas
Building : WAREHOUSE
Location : 51 INGERSOLL DR., PORTLAND, ME 04103
System : 1 OF 1
Contract : 10089
Data File : AIRGAS1(B).WXF

Hydraulic Design Information Sheet

Name - AIRGAS
Location - 51 INGERSOLL DR., PORTLAND, ME 04103
Building - WAREHOUSE
Contractor - OWNER
Calculated By - KRISTOPHER J. FISH
Construction: ( ) Combustible (X) Non-Combustible
Occupancy - INDUSTRIAL WAREHOUSE

Date - 12-15-2010
System No. - 1 OF 1
Contract No. - 10089
Drawing No. - 1 OF 1
Ceiling Height - OBJ

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 (X) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other

Specific Ruling	Made By	Date

Area of Sprinkler Operation - 2000 SF	System Type	Sprinkler/Nozzle
Density - .3	(X) Wet	Make RELIABLE
Area Per Sprinkler - 90	( ) Dry	Model G
Elevation at Highest Outlet - 69.750	( ) Deluge	Size 17/32" X 3/4"
Hose Allowance - Inside -	( ) Preaction	K-Factor 8.0
Rack Sprinkler Allowance -	( ) Other	Temp.Rat.286 DEG
Hose Allowance - Outside - 500 GPM	AT X1	

Note DESIGN AREA #1 - WAREHOUSE

Calculation Summary

Flow Required - 847.13 Press Required - 31.072 AT BASE OF RISER
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 7-27-2005		Cap. -
Time of Test -	Rated Cap.-	Elev.-
Static Press - 82	@ Press -	
Residual Press - 80	Elev. -	Well
Flow - 2576		Proof Flow
Elevation - 62		

Location - WATER WAS FLOWED FROM HYD 4305 ON RIVERSIDE ST FROM A 12" CIRCULATING CITY MAIN. TEST GUAGES READ FROM HYD 1541 ON RIVERSIDE ST.
Source of Information - PORTLAND WATER DISTRICT

COMMODITY STORAGE

Commodity Class Location
Storage Ht. Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.
( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non
( ) Mult. Row		( ) Open Shelf	

RACK STORAGE

Flue Spacing
Longitudinal
Clearance:Storage to Ceiling
Transverse

Horizontal Barriers Provided:

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	90' Flow Thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	69.75	8	13.32	na	29.19	0.3	70.553	7.0
2	69.75	8	13.36	na	29.24	0.3	90	11.391
3	69.75	8	13.62	na	29.52	0.3	90	11.391
4	69.75	8	14.16	na	30.1	0.3	90	11.391
5	69.75	8	15.0	na	30.98	0.3	90	11.391
6	69.75	8	15.08	na	31.07	0.3	90	11.391
7	69.75	8	13.39	na	29.27	0.3	70.553	7.0
8	69.75	8	13.43	na	29.32	0.3	90	11.391
9	69.75	8	13.69	na	29.6	0.3	90	11.391
10	69.75	8	14.23	na	30.18	0.3	90	11.391
11	69.75	8	15.08	na	31.07	0.3	90	11.391
12	69.75	8	15.16	na	31.15	0.3	90	11.391
13	69.75	8	13.64	na	29.55	0.3	70.553	7.0
14	69.75	8	13.69	na	29.6	0.3	90	11.391
15	69.75	8	13.95	na	29.88	0.3	90	11.391
16	69.75	8	14.51	na	30.47	0.3	90	11.391
17	69.75	8	15.37	na	31.36	0.3	90	11.391
18	69.75	8	15.45	na	31.44	0.3	90	11.391
19	69.75	8	11.35	na	26.95	0.3	70.553	7.0
20	69.75	8	11.39	na	27.0	0.3	90	11.391
21	69.75	8	11.61	na	27.26	0.3	90	11.391
22	69.75	8	12.65	na	28.46	0.3	70.553	7.0
23	69.75	8	14.6	na	30.57	0.3	90	11.391
24	69.75	8	15.98	na	31.98	0.3	90	11.391
25	69.75	8	16.06	na	32.06	0.3	90	11.391
26	69.75	8	17.08	na	33.06	0.3	90	11.391
27	69.75	8	17.17	na	33.14	0.3	90	11.391
28	69.75	8	17.69	na	33.65	0.3	90	11.391
A	69.75		15.68	na				
B	69.75		15.76	na				
C	69.75		16.06	na				
D	69.75		16.69	na				
E	69.75		17.84	na				
F	69.75		24.34	na				
G	66.25		30.16	na				
RT	66.25		31.07	na				
RB	48.25		43.54	na				
X1	59.0		61.21	na	500.0			
TEST	62.0		61.54	na				

The maximum velocity is 19.07 and it occurs in the pipe between nodes E and F

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
1	29.19	2.157		0.0	6.000	13.316		K Factor = 8.00
to		120		0.0	0.0	0.0		
2	29.19	0.0078		0.0	6.000	0.047		Vel = 2.56
2	29.25	2.157		0.0	9.000	13.363		K Factor = 8.00
to		120		0.0	0.0	0.0		
3	58.44	0.0282		0.0	9.000	0.254		Vel = 5.13
3	29.52	2.157		0.0	9.000	13.617		K Factor = 8.00
to		120		0.0	0.0	0.0		
4	87.96	0.0602		0.0	9.000	0.542		Vel = 7.72
4	30.10	2.157	1T	12.307	2.333	14.159		K Factor = 8.00
to		120		0.0	12.307	0.0		
A	118.06	0.1038		0.0	14.640	1.520		Vel = 10.37
	0.0							
	118.06					15.679		K Factor = 29.82
5	30.98	2.157		0.0	9.000	15.001		K Factor = 8.00
to		120		0.0	0.0	0.0		
6	30.98	0.0088		0.0	9.000	0.079		Vel = 2.72
6	31.07	2.157	1T	12.307	6.667	15.080		K Factor = 8.00
to		120		0.0	12.307	0.0		
A	62.05	0.0316		0.0	18.974	0.599		Vel = 5.45
	0.0							
	62.05					15.679		K Factor = 15.67
7	29.27	2.157		0.0	6.000	13.387		K Factor = 8.00
to		120		0.0	0.0	0.0		
8	29.27	0.0078		0.0	6.000	0.047		Vel = 2.57
8	29.32	2.157		0.0	9.000	13.434		K Factor = 8.00
to		120		0.0	0.0	0.0		
9	58.59	0.0284		0.0	9.000	0.256		Vel = 5.14
9	29.60	2.157		0.0	9.000	13.690		K Factor = 8.00
to		120		0.0	0.0	0.0		
10	88.19	0.0604		0.0	9.000	0.544		Vel = 7.74
10	30.18	2.157	1T	12.307	2.333	14.234		K Factor = 8.00
to		120		0.0	12.307	0.0		
B	118.37	0.1043		0.0	14.640	1.527		Vel = 10.39
	0.0							
	118.37					15.761		K Factor = 29.82
11	31.07	2.157		0.0	9.000	15.080		K Factor = 8.00
to		120		0.0	0.0	0.0		
12	31.07	0.0088		0.0	9.000	0.079		Vel = 2.73
12	31.14	2.157	1T	12.307	6.667	15.159		K Factor = 8.00
to		120		0.0	12.307	0.0		
B	62.21	0.0317		0.0	18.974	0.602		Vel = 5.46

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0							
	62.21					15.761		K Factor = 15.67
13	29.55	2.157		0.0	6.000	13.643		K Factor = 8.00
to		120		0.0	0.0	0.0		
14	29.55	0.0080		0.0	6.000	0.048		Vel = 2.59
14	29.60	2.157		0.0	9.000	13.691		K Factor = 8.00
to		120		0.0	0.0	0.0		
15	59.15	0.0289		0.0	9.000	0.260		Vel = 5.19
15	29.88	2.157		0.0	9.000	13.951		K Factor = 8.00
to		120		0.0	0.0	0.0		
16	89.03	0.0616		0.0	9.000	0.554		Vel = 7.82
16	30.47	2.157	1T	12.307	2.333	14.505		K Factor = 8.00
to		120		0.0	12.307	0.0		
C	119.5	0.1061		0.0	14.640	1.554		Vel = 10.49
	0.0							
	119.50					16.059		K Factor = 29.82
17	31.36	2.157		0.0	9.000	15.366		K Factor = 8.00
to		120		0.0	0.0	0.0		
18	31.36	0.0090		0.0	9.000	0.081		Vel = 2.75
18	31.44	2.157	1T	12.307	6.667	15.447		K Factor = 8.00
to		120		0.0	12.307	0.0		
C	62.8	0.0323		0.0	18.974	0.612		Vel = 5.51
	0.0							
	62.80					16.059		K Factor = 15.67
19	26.95	2.157		0.0	6.000	11.350		K Factor = 8.00
to		120		0.0	0.0	0.0		
20	26.95	0.0068		0.0	6.000	0.041		Vel = 2.37
20	27.00	2.157		0.0	9.000	11.391		K Factor = 8.00
to		120		0.0	0.0	0.0		
21	53.95	0.0243		0.0	9.000	0.219		Vel = 4.74
21	27.26	2.157	2E	12.307	7.750	11.610		K Factor = 8.00
to		120		0.0	12.307	0.0		
22	81.21	0.0520		0.0	20.057	1.042		Vel = 7.13
22	28.46	2.157	2E	12.307	9.250	12.652		K Factor = 8.00
to		120		0.0	12.307	0.0		
23	109.67	0.0906		0.0	21.557	1.953		Vel = 9.63
23	30.57	2.157	1T	12.307	2.333	14.605		K Factor = 8.00
to		120		0.0	12.307	0.0		
D	140.24	0.1427		0.0	14.640	2.089		Vel = 12.31
	0.0							
	140.24					16.694		K Factor = 34.32

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
24	31.98	2.157	0.0	9.000	15.976		K Factor = 8.00
to		120	0.0	0.0	0.0		
25	31.98	0.0092	0.0	9.000	0.083		Vel = 2.81
25	32.06	2.157	1T 12.307	6.667	16.059		K Factor = 8.00
to		120	0.0	12.307	0.0		
D	64.04	0.0335	0.0	18.974	0.635		Vel = 5.62
	0.0						
	64.04				16.694		K Factor = 15.67
26	33.06	2.157	0.0	9.000	17.077		K Factor = 8.00
to		120	0.0	0.0	0.0		
27	33.06	0.0098	0.0	9.000	0.088		Vel = 2.90
27	33.14	2.157	1T 12.307	6.667	17.165		K Factor = 8.00
to		120	0.0	12.307	0.0		
E	66.2	0.0356	0.0	18.974	0.676		Vel = 5.81
	0.0						
	66.20				17.841		K Factor = 15.67
28	33.65	2.157	1T 12.307	2.333	17.692		K Factor = 8.00
to		120	0.0	12.307	0.0		
E	33.65	0.0102	0.0	14.640	0.149		Vel = 2.95
	0.0						
	33.65				17.841		K Factor = 7.97
A	180.11	4.26	0.0	10.000	15.679		
to		120	0.0	0.0	0.0		
B	180.11	0.0082	0.0	10.000	0.082		Vel = 4.05
B	180.59	4.26	0.0	10.000	15.761		
to		120	0.0	0.0	0.0		
C	360.7	0.0298	0.0	10.000	0.298		Vel = 8.12
C	182.30	4.26	0.0	10.000	16.059		
to		120	0.0	0.0	0.0		
D	543.0	0.0635	0.0	10.000	0.635		Vel = 12.22
D	204.28	4.26	0.0	10.000	16.694		
to		120	0.0	0.0	0.0		
E	747.28	0.1147	0.0	10.000	1.147		Vel = 16.82
E	99.85	4.26	1E 13.167	31.750	17.841		
to		120	0.0	13.167	0.0		
F	847.13	0.1446	0.0	44.917	6.494		Vel = 19.07
F	0.0	4.26	1T 26.334	3.500	24.335		
to		120	0.0	26.334	1.516		
G	847.13	0.1446	0.0	29.834	4.314		Vel = 19.07
G	0.0	6.357	1T 37.72	6.333	30.165		
to		120	0.0	37.720	0.0		
RT	847.13	0.0206	0.0	44.053	0.907		Vel = 8.56

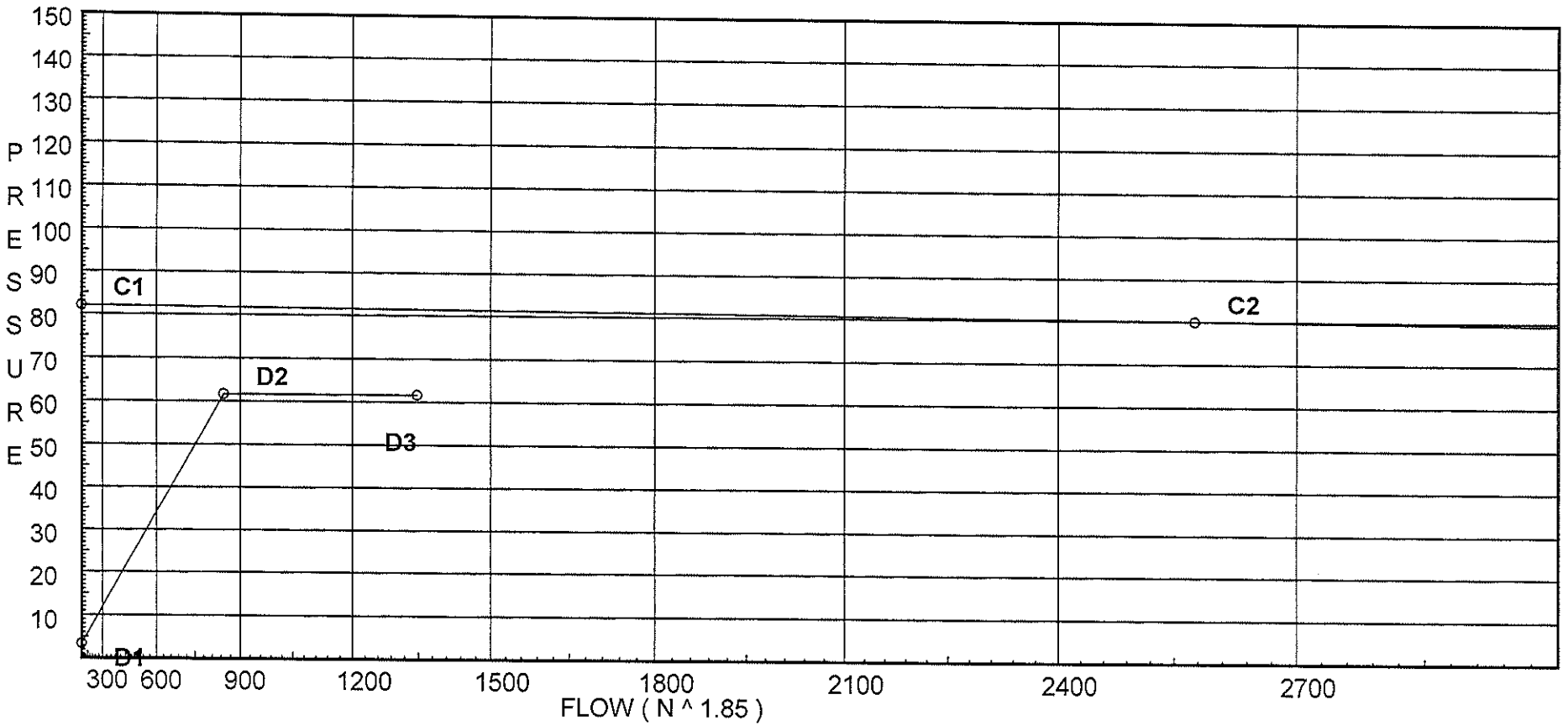
Sprinkler Systems, Inc.
Air Gas

Hyd. Ref. Point	Qa / Qt	Dia. "C" / Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
RT	0.0	6.357	1Z	17.603	17.833	31.072		
to		120	1Zac	0.0	17.603	11.739		* Fixed loss = 3.944
RB	847.13	0.0206		0.0	35.436	0.729		Vel = 8.56
RB	0.0	6.16	2E	40.168	1150.000	43.540		
to		140	1T	43.037	87.509	-4.656		
X1	847.13	0.0180	1G	4.304	1237.509	22.326		Vel = 9.12
X1	500.00	12.34		0.0	1130.000	61.210		Qa = 500
to		140		0.0	0.0	-1.299		
TEST	1347.13	0.0014		0.0	1130.000	1.631		Vel = 3.61
	0.0							
	1347.13					61.542		K Factor = 171.72

City Water Supply:
C1 - Static Pressure : 82
C2 - Residual Pressure: 80
C2 - Residual Flow : 2576

Demand:

D1 - Elevation	:	3.357
D2 - System Flow	:	847.13
D2 - System Pressure	:	61.542
Hose (Adj City)	:	
Hose (Demand)	:	500
D3 - System Demand	:	1347.13
Safety Margin	:	19.855



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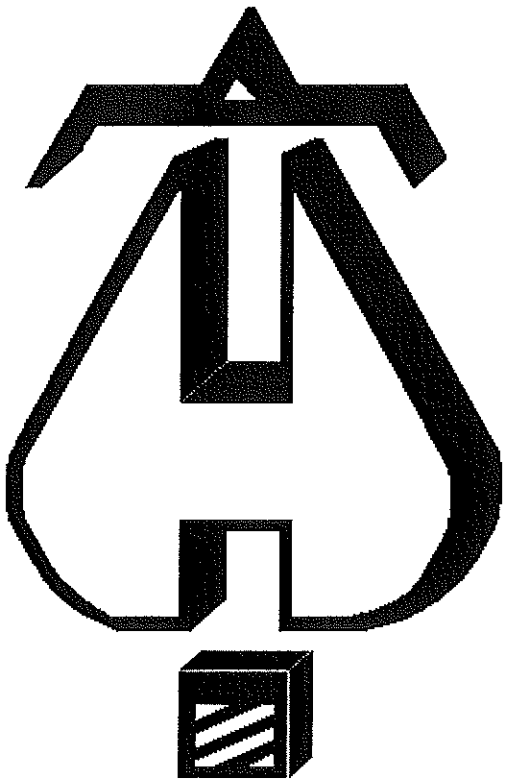


. . . Fire Protection by Computer Design

Sprinkler Systems, Inc.
2-4 Avon Street
P.O. Box 1285
Lewiston, Maine 04240
207-782-0104

Job Name	:	Air Gas
Building	:	WAREHOUSE
Location	:	51 INGERSOLL DR., PORTLAND, ME 04103
System	:	1 OF 1
Contract	:	10089
Data File	:	AIRGAS1(B).WXF

Hydraulic Design Information Sheet

Name - AIRGAS
Location - 51 INGERSOLL DR., PORTLAND, ME 04103
Building - WAREHOUSE
Contractor - OWNER
Calculated By - KRISTOPHER J. FISH
Construction: ( ) Combustible (X) Non-Combustible
Occupancy - INDUSTRIAL WAREHOUSE

Date - 12-15-2010
System No. - 1 OF 1
Contract No. - 10089
Drawing No. - 1 OF 1
Ceiling Height - OBJ

SYSTEM DESIGN

(X) NFPA 13 ( ) Lt. Haz. Ord.Haz.Gp. ( ) 1 ( ) 2 ( ) 3 (X) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other
Specific Ruling Made By Date

Area of Sprinkler Operation	- 2000 SF	System Type	Sprinkler/Nozzle
Density	- .3	(X) Wet	Make RELIABLE
Area Per Sprinkler	- 90	( ) Dry	Model G
Elevation at Highest Outlet	- 69.750	( ) Deluge	Size 17/32" X 3/4"
Hose Allowance - Inside	-	( ) Preaction	K-Factor 8.0
Rack Sprinkler Allowance	-	( ) Other	Temp.Rat.286 DEG
Hose Allowance - Outside	- 500 GPM	AT X1	

Note DESIGN AREA #1 - WAREHOUSE

Calculation Summary: Flow Required - 847.13 Press Required - 31.072 AT BASE OF RISER
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:		Pump Data:		Tank or Reservoir:	
Date of Test	- 7-27-2005			Cap. -	
Time of Test	-	Rated Cap.-		Elev.-	
Static Press	- 82	@ Press	-		
Residual Press	- 80	Elev.	-		Well
Flow	- 2576				Proof Flow
Elevation	- 62				

Location - WATER WAS FLOWED FROM HYD 4305 ON RIVERSIDE ST FROM A 12" CIRCULATING CITY MAIN. TEST GUAGES READ FROM HYD 1541 ON RIVERSIDE ST.
Source of Information - PORTLAND WATER DISTRICT

COMMODITY STORAGE

Commodity Class Location
Storage Ht. Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.
( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non
( ) Mult. Row		( ) Open Shelf	

RACK STORAGE

Flue Spacing Clearance:Storage to Ceiling
Longitudinal Transverse

Horizontal Barriers Provided:

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	90' Flow Thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zac	Ames 2000SS	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	69.75	8	13.32	na	29.19	0.3	70.553	7.0
2	69.75	8	13.36	na	29.24	0.3	90	11.391
3	69.75	8	13.62	na	29.52	0.3	90	11.391
4	69.75	8	14.16	na	30.1	0.3	90	11.391
5	69.75	8	15.0	na	30.98	0.3	90	11.391
6	69.75	8	15.08	na	31.07	0.3	90	11.391
7	69.75	8	13.39	na	29.27	0.3	70.553	7.0
8	69.75	8	13.43	na	29.32	0.3	90	11.391
9	69.75	8	13.69	na	29.6	0.3	90	11.391
10	69.75	8	14.23	na	30.18	0.3	90	11.391
11	69.75	8	15.08	na	31.07	0.3	90	11.391
12	69.75	8	15.16	na	31.15	0.3	90	11.391
13	69.75	8	13.64	na	29.55	0.3	70.553	7.0
14	69.75	8	13.69	na	29.6	0.3	90	11.391
15	69.75	8	13.95	na	29.88	0.3	90	11.391
16	69.75	8	14.51	na	30.47	0.3	90	11.391
17	69.75	8	15.37	na	31.36	0.3	90	11.391
18	69.75	8	15.45	na	31.44	0.3	90	11.391
19	69.75	8	11.35	na	26.95	0.3	70.553	7.0
20	69.75	8	11.39	na	27.0	0.3	90	11.391
21	69.75	8	11.61	na	27.26	0.3	90	11.391
22	69.75	8	12.65	na	28.46	0.3	70.553	7.0
23	69.75	8	14.6	na	30.57	0.3	90	11.391
24	69.75	8	15.98	na	31.98	0.3	90	11.391
25	69.75	8	16.06	na	32.06	0.3	90	11.391
26	69.75	8	17.08	na	33.06	0.3	90	11.391
27	69.75	8	17.17	na	33.14	0.3	90	11.391
28	69.75	8	17.69	na	33.65	0.3	90	11.391
A	69.75		15.68	na				
B	69.75		15.76	na				
C	69.75		16.06	na				
D	69.75		16.69	na				
E	69.75		17.84	na				
F	69.75		24.34	na				
G	66.25		30.16	na				
RT	66.25		31.07	na				
RB	48.25		43.54	na				
X1	59.0		61.21	na	500.0			
TEST	62.0		61.54	na				

The maximum velocity is 19.07 and it occurs in the pipe between nodes E and F

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
1	29.19	2.157	0.0	6.000	13.316		K Factor = 8.00
to		120	0.0	0.0	0.0		
2	29.19	0.0078	0.0	6.000	0.047		Vel = 2.56
2	29.25	2.157	0.0	9.000	13.363		K Factor = 8.00
to		120	0.0	0.0	0.0		
3	58.44	0.0282	0.0	9.000	0.254		Vel = 5.13
3	29.52	2.157	0.0	9.000	13.617		K Factor = 8.00
to		120	0.0	0.0	0.0		
4	87.96	0.0602	0.0	9.000	0.542		Vel = 7.72
4	30.10	2.157	1T 12.307	2.333	14.159		K Factor = 8.00
to		120	0.0	12.307	0.0		
A	118.06	0.1038	0.0	14.640	1.520		Vel = 10.37
	0.0						
	118.06				15.679		K Factor = 29.82
5	30.98	2.157	0.0	9.000	15.001		K Factor = 8.00
to		120	0.0	0.0	0.0		
6	30.98	0.0088	0.0	9.000	0.079		Vel = 2.72
6	31.07	2.157	1T 12.307	6.667	15.080		K Factor = 8.00
to		120	0.0	12.307	0.0		
A	62.05	0.0316	0.0	18.974	0.599		Vel = 5.45
	0.0						
	62.05				15.679		K Factor = 15.67
7	29.27	2.157	0.0	6.000	13.387		K Factor = 8.00
to		120	0.0	0.0	0.0		
8	29.27	0.0078	0.0	6.000	0.047		Vel = 2.57
8	29.32	2.157	0.0	9.000	13.434		K Factor = 8.00
to		120	0.0	0.0	0.0		
9	58.59	0.0284	0.0	9.000	0.256		Vel = 5.14
9	29.60	2.157	0.0	9.000	13.690		K Factor = 8.00
to		120	0.0	0.0	0.0		
10	88.19	0.0604	0.0	9.000	0.544		Vel = 7.74
10	30.18	2.157	1T 12.307	2.333	14.234		K Factor = 8.00
to		120	0.0	12.307	0.0		
B	118.37	0.1043	0.0	14.640	1.527		Vel = 10.39
	0.0						
	118.37				15.761		K Factor = 29.82
11	31.07	2.157	0.0	9.000	15.080		K Factor = 8.00
to		120	0.0	0.0	0.0		
12	31.07	0.0088	0.0	9.000	0.079		Vel = 2.73
12	31.14	2.157	1T 12.307	6.667	15.159		K Factor = 8.00
to		120	0.0	12.307	0.0		
B	62.21	0.0317	0.0	18.974	0.602		Vel = 5.46

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
	0.0 62.21					15.761		K Factor = 15.67
13 to 14	29.55 29.55	2.157 120 0.0080		0.0 0.0 0.0	6.000 0.0 6.000	13.643 0.0 0.048		K Factor = 8.00 Vel = 2.59
14 to 15	29.60 59.15	2.157 120 0.0289		0.0 0.0 0.0	9.000 0.0 9.000	13.691 0.0 0.260		K Factor = 8.00 Vel = 5.19
15 to 16	29.88 89.03	2.157 120 0.0616		0.0 0.0 0.0	9.000 0.0 9.000	13.951 0.0 0.554		K Factor = 8.00 Vel = 7.82
16 to C	30.47 119.5	2.157 120 0.1061	1T	12.307 0.0 0.0	2.333 12.307 14.640	14.505 0.0 1.554		K Factor = 8.00 Vel = 10.49
	0.0 119.50					16.059		K Factor = 29.82
17 to 18	31.36 31.36	2.157 120 0.0090		0.0 0.0 0.0	9.000 0.0 9.000	15.366 0.0 0.081		K Factor = 8.00 Vel = 2.75
18 to C	31.44 62.8	2.157 120 0.0323	1T	12.307 0.0 0.0	6.667 12.307 18.974	15.447 0.0 0.612		K Factor = 8.00 Vel = 5.51
	0.0 62.80					16.059		K Factor = 15.67
19 to 20	26.95 26.95	2.157 120 0.0068		0.0 0.0 0.0	6.000 0.0 6.000	11.350 0.0 0.041		K Factor = 8.00 Vel = 2.37
20 to 21	27.00 53.95	2.157 120 0.0243		0.0 0.0 0.0	9.000 0.0 9.000	11.391 0.0 0.219		K Factor = 8.00 Vel = 4.74
21 to 22	27.26 81.21	2.157 120 0.0520	2E	12.307 0.0 0.0	7.750 12.307 20.057	11.610 0.0 1.042		K Factor = 8.00 Vel = 7.13
22 to 23	28.46 109.67	2.157 120 0.0906	2E	12.307 0.0 0.0	9.250 12.307 21.557	12.652 0.0 1.953		K Factor = 8.00 Vel = 9.63
23 to D	30.57 140.24	2.157 120 0.1427	1T	12.307 0.0 0.0	2.333 12.307 14.640	14.605 0.0 2.089		K Factor = 8.00 Vel = 12.31
	0.0 140.24					16.694		K Factor = 34.32

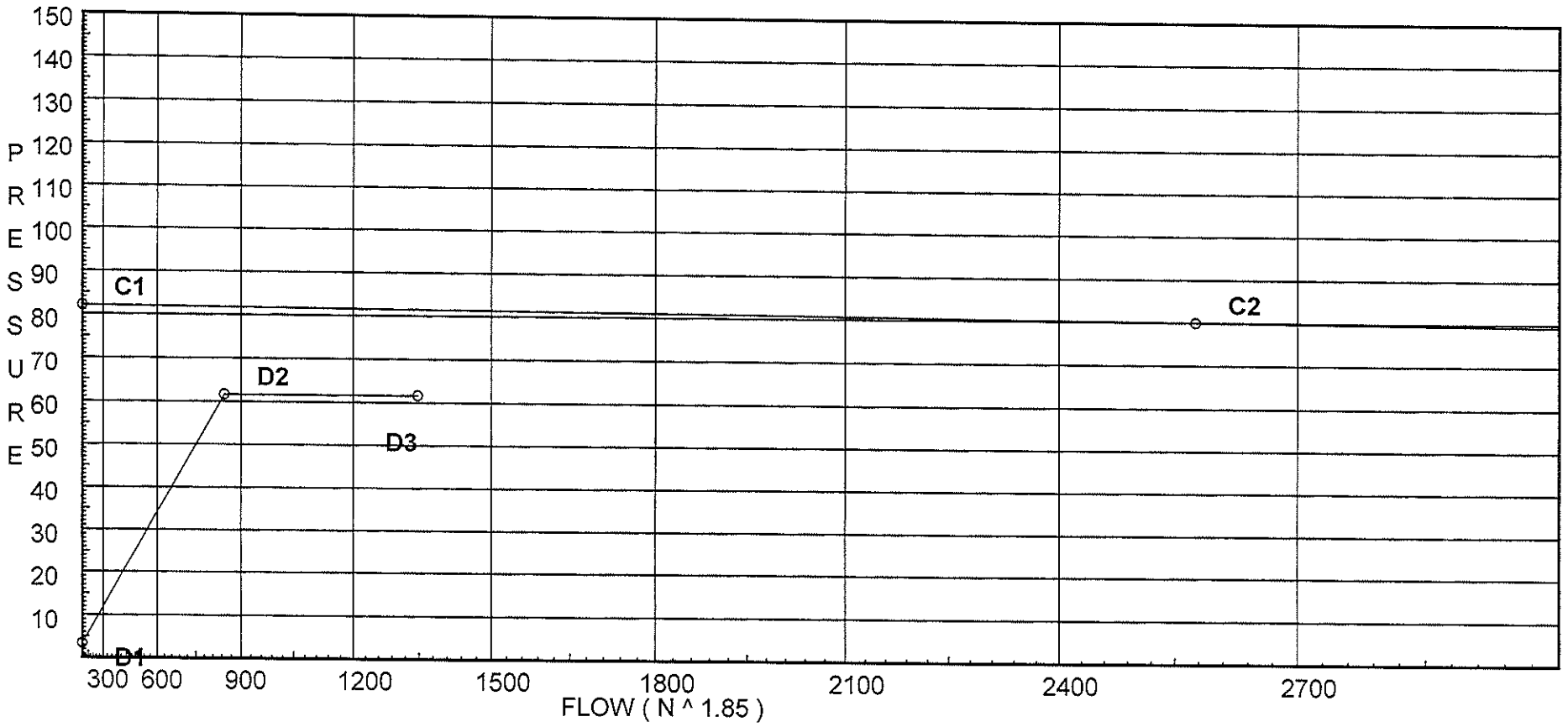
Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
24	31.98	2.157		0.0	9.000	15.976		K Factor = 8.00
to		120		0.0	0.0	0.0		
25	31.98	0.0092		0.0	9.000	0.083		Vel = 2.81
25	32.06	2.157	1T	12.307	6.667	16.059		K Factor = 8.00
to		120		0.0	12.307	0.0		
D	64.04	0.0335		0.0	18.974	0.635		Vel = 5.62
	0.0							
	64.04					16.694		K Factor = 15.67
26	33.06	2.157		0.0	9.000	17.077		K Factor = 8.00
to		120		0.0	0.0	0.0		
27	33.06	0.0098		0.0	9.000	0.088		Vel = 2.90
27	33.14	2.157	1T	12.307	6.667	17.165		K Factor = 8.00
to		120		0.0	12.307	0.0		
E	66.2	0.0356		0.0	18.974	0.676		Vel = 5.81
	0.0							
	66.20					17.841		K Factor = 15.67
28	33.65	2.157	1T	12.307	2.333	17.692		K Factor = 8.00
to		120		0.0	12.307	0.0		
E	33.65	0.0102		0.0	14.640	0.149		Vel = 2.95
	0.0							
	33.65					17.841		K Factor = 7.97
A	180.11	4.26		0.0	10.000	15.679		
to		120		0.0	0.0	0.0		
B	180.11	0.0082		0.0	10.000	0.082		Vel = 4.05
B	180.59	4.26		0.0	10.000	15.761		
to		120		0.0	0.0	0.0		
C	360.7	0.0298		0.0	10.000	0.298		Vel = 8.12
C	182.30	4.26		0.0	10.000	16.059		
to		120		0.0	0.0	0.0		
D	543.0	0.0635		0.0	10.000	0.635		Vel = 12.22
D	204.28	4.26		0.0	10.000	16.694		
to		120		0.0	0.0	0.0		
E	747.28	0.1147		0.0	10.000	1.147		Vel = 16.82
E	99.85	4.26	1E	13.167	31.750	17.841		
to		120		0.0	13.167	0.0		
F	847.13	0.1446		0.0	44.917	6.494		Vel = 19.07
F	0.0	4.26	1T	26.334	3.500	24.335		
to		120		0.0	26.334	1.516		
G	847.13	0.1446		0.0	29.834	4.314		Vel = 19.07
G	0.0	6.357	1T	37.72	6.333	30.165		
to		120		0.0	37.720	0.0		
RT	847.13	0.0206		0.0	44.053	0.907		Vel = 8.56

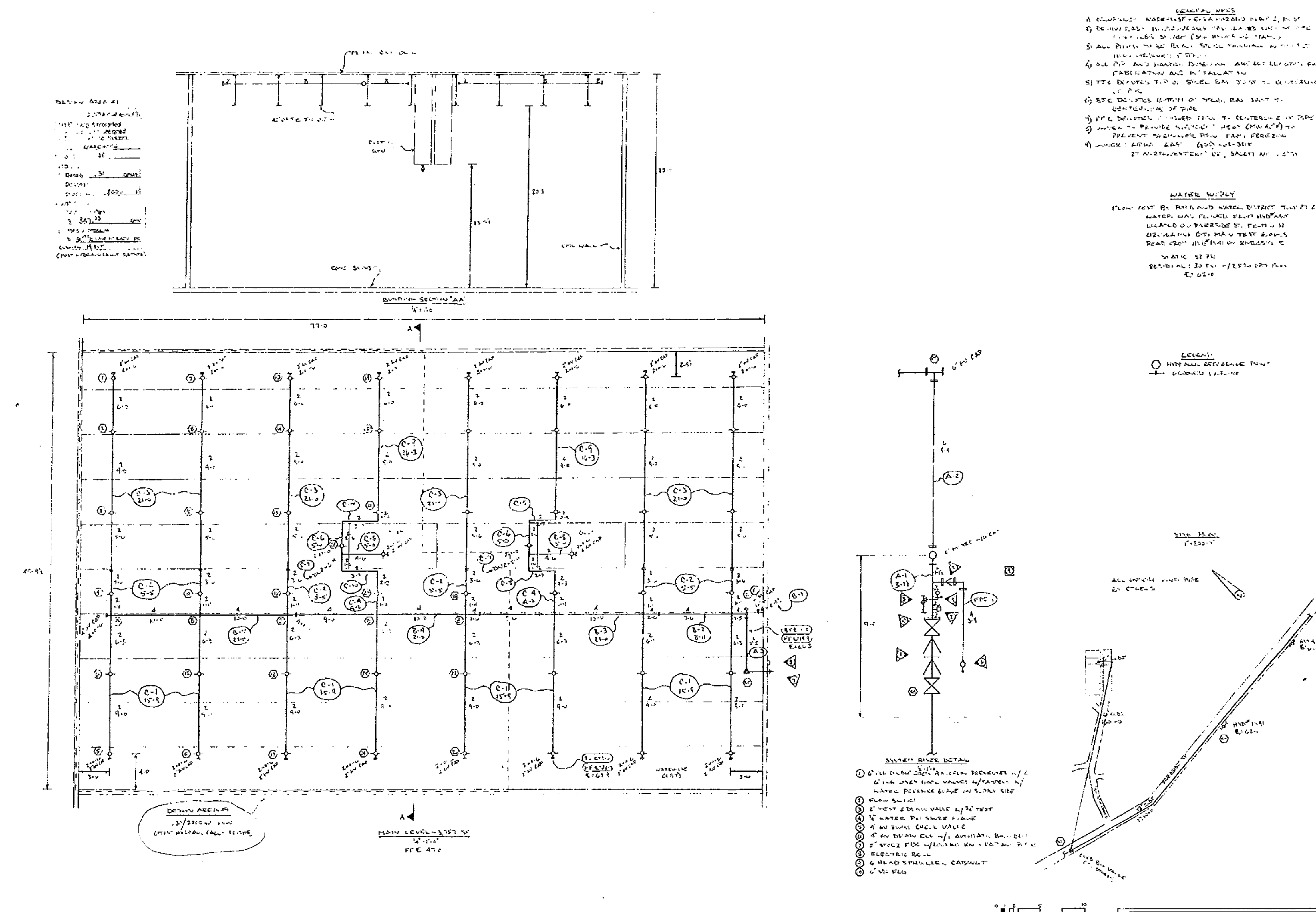
Hyd. Ref. Point	Qa / Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
RT	0.0	6.357	1Z	17.603	17.833	31.072		
to		120	1Zac	0.0	17.603	11.739		* Fixed loss = 3.944
RB	847.13	0.0206		0.0	35.436	0.729		Vel = 8.56
RB	0.0	6.16	2E	40.168	1150.000	43.540		
to		140	1T	43.037	87.509	-4.656		
X1	847.13	0.0180	1G	4.304	1237.509	22.326		Vel = 9.12
X1	500.00	12.34		0.0	1130.000	61.210		Qa = 500
to		140		0.0	0.0	-1.299		
TEST	1347.13	0.0014		0.0	1130.000	1.631		Vel = 3.61
	0.0							
	1347.13					61.542		K Factor = 171.72

City Water Supply:
C1 - Static Pressure : 82
C2 - Residual Pressure: 80
C2 - Residual Flow : 2576

Demand:

D1 - Elevation	:	3.357
D2 - System Flow	:	847.13
D2 - System Pressure	:	61.542
Hose (Adj City)	:	
Hose (Demand)	:	500
D3 - System Demand	:	1347.13
Safety Margin	:	19.855





HYDRAULIC DESIGN CRITERIA	
Density	.3 GPM/SF
Remote Area	2000 SF
K Factor	8.0
Head Size	17/32
Hose Allowance	500 GPM
Water Supply	7-27-10
Static	52
Residual	30
Water Flowing	2,570
Size of Supply	12"

1. Type of Hazard: EH/OH2 2. Deflector Distance: 1"-12"
3. Pipe Type Used: Black Steel 4. Sprinkler Area: 3,757
5. Type of Construction: Steel
6. Maximum Spacing Allowed: 130 SF
7. PIPE SIZING METHOD, PIPE SCHEDULE ☐ HYDRAULICALLY CALCULATED ■
8. ALL HANGERS AND LOCATIONS TO BE IN ACCORDANCE WITH N.F.P.A. PAMPHLET NO. 13
9. HIGH DEGREE TEMPERATURE SPRINKLER HEADS TO BE INSTALLED IN ACCORDANCE WITH N.F.P.A. PAMPHLET NO. 13

CIRCLE HANGER TYPE TO BE USED

HANGERS	
Symbol	Description
	3/8" SAMMY EXPRESS
	ATR

SPRINKLER HEAD LEGEND									
SYMBOL	MAKE	MODEL	FINISH	TYPE	TEMP.	N.P.T.	ORIFICE	K-FACTOR	TOTAL
	RELIABLE					3/4"	17/32"	8.0	52
								TOTAL	52

SUBMITTALS	
SENT TO	
DATE SENT	DATE RECEIVED
ISO ☐	
FM ☐	
LM ☐	
IRI ☐	
LA ☐	
STATE FIRE ■	
LOCAL FIRE ■	
LOCAL WATER ☐	
OWNER ■	

LICENSE #093
RMS #278
PERMIT #
SPRINKLER SYSTEMS INC.
P.O. BOX 1255
LEWISTON MAINE
04243

AIRGAS
51 INGERSOLL DRIVE
PORTLAND ME 04103
CONTRACT WITH OWNER

SYSTEM TYPE		REVISIONS		
		NO	DATE	DESCRIPTION
WET	■			
DRY	☐			
DELUGE	☐			
PREACTION	☐			
ME LIFE	☐			

SCALE 1/4"=1'-0"
DRAWN BY KJF
CHECKED BY SEG
DATE 12-15-10
TOTAL SPKRS ON JOB 52
SHEET # 1 OF 1
JOB # 10089